In the Claims

This listing of claims replaces all prior versions and listings of claims in the application. Please amend the claims as indicated.

1. (original) A method of generating at least two modulation signals from a local oscillator signal for quadrature subharmonic modulation of a quadrature amplitude modulated information signal, such method comprising the steps of:

delaying the local oscillator signal in a plurality of incremental delay steps to form at least two sets of modulator signals, one of said sets of modulator signals together forming the first modulation signal and another of said sets forming the second modulation signal for quadrature subharmonic modulation of the quadrature amplitude modulated information signal; and

controlling a magnitude of the incremental delays based upon a predetermined phase offset between the local oscillator signal and a last delay step of the incremental delay steps.

2. (original) The method of generating first and second local oscillator signals as in claim 1 further comprising defining the first modulation signal as a real part of the quadrature subharmonic modulation signal.

3. (original) The method of generating first and second local oscillator signals as in claim 1 further comprising defining the second modulation signal as an imaginary part of the quadrature subharmonic modulation signal.

4. (original) The method of generating first and second local oscillator signals as in claim 1 further comprising defining the delay of each delay step as substantially equal to ninety degrees divided by a modulator multiplier value.

5. (original) The method of generating first and second local oscillator signals as in claim 4 further comprising defining the first and second modulation signals as having a number of respective odd and even members equal to two times the modulator multiplier value.

6. (original) The method of generating first and second local oscillator signals as in claim 1 further comprising defining a first incremental delay step as equal to zero degrees.

7. (currently amended) The method of generating first and second local oscillator signals as in claim 6 further comprising defining a second incremental delay step as equal to ~~forth~~ forty-five degrees.

8. (original) The method of generating first and second local oscillator signals as in claim 7 further comprising defining a third incremental odd delay step as equal to ninety degrees.

9. (original) The method of generating first and second local oscillator signals as in claim 8 further comprising defining a fourth incremental delay step as equal to one-hundred and thirty-five degrees.

10. (original) Apparatus for generating at least two modulation signals from a local oscillator signal for quadrature subharmonic modulation of a quadrature amplitude modulated information signal, such apparatus comprising:

means for delaying the local oscillator signal in a plurality of incremental delay steps to form at least two sets of modulator signals, one of said sets of modulator signals together forming the first modulation signal and another of said sets forming the second modulation signal for quadrature subharmonic modulation of the quadrature amplitude modulated information signal; and

means for controlling a magnitude of the incremental delays based upon a predetermined phase offset between the local oscillator signal and a last delay step of the incremental delay steps.

11. (original) The apparatus for generating first and second local oscillator signals as in claim 10 further comprising means for defining the first modulation signal as a real part of the quadrature subharmonic modulation signal.

12. (original) The apparatus for generating first and second local oscillator signals as in claim 10 further comprising means for defining the second modulation signal as an imaginary part of the quadrature subharmonic modulation signal.

13. (original) The apparatus for generating first and second local oscillator signals as in claim 10 further comprising means for defining the delay of each delay step as substantially equal to ninety degrees divided by a modulator multiplier value.

14. (original) The apparatus for generating first and second local oscillator signals as in claim 13 further comprising means for defining the first and second modulation signals as having a number of respective odd and even members equal to two times the modulator multiplier value.

15. (original) The apparatus for generating first and second local oscillator signals as in claim 10 further comprising means for defining a first incremental delay step as equal to zero degrees.

16. (currently amended) The apparatus for generating first and second local oscillator signals as in claim 15 further comprising means for defining a second incremental delay step as equal to ~~forth~~ forty-five degrees.

17. (original) The apparatus for generating first and second local oscillator signals as in claim 16 further comprising means for defining a third incremental delay step as equal to ninety degrees.

18. (original) The apparatus for generating first and second local oscillator signals as in claim 17 further comprising means for defining a fourth incremental delay step as equal to one-hundred and thirty-five degrees.

19. (original) Apparatus for generating first and second modulation signals from a local oscillator signal for quadrature subharmonic modulation of a quadrature amplitude modulated information signal, such apparatus comprising:

a delay chain adapted to delay the local oscillator signal in a plurality of incremental delay steps to form at least two sets of modulator signals, one of said sets of modulator signals together forming the first modulation signal and another of said sets forming the second modulation signal for quadrature subharmonic modulation of the quadrature amplitude modulated information signal; and

a feedback circuit adapted to control a magnitude of the incremental delays based upon a predetermined phase offset between the local oscillator signal and a last delay step of the incremental delay steps.

20. (original) The apparatus for generating first and second local oscillator signals as in claim 19 wherein the first modulation signal further comprises a real part of the quadrature subharmonic modulation signal.

21. (original) The apparatus for generating first and second local oscillator signals as in claim 19 wherein the second modulation signal further comprises an imaginary part of the quadrature subharmonic modulation signal.

22. (original) The apparatus for generating first and second local oscillator signals as in claim 19 wherein the delay chain further comprises a plurality of series connected delay elements where each delay step is substantially equal to ninety degrees divided by a modulator multiplier value.

23. (original) The apparatus for generating first and second local oscillator signals as in claim 22 wherein the first and second signals further comprise respective sets of odd and even members equal to two times the modulator multiplier value.

24. (currently amended) The apparatus for generating first and second local oscillator signals as in claim 19, wherein a first incremental odd delay step of the delay chain further comprises zero degrees.

25. (currently amended) The apparatus for generating first and second local oscillator signals as in claim 24 wherein a second incremental delay step further comprises

~~forth~~ forty-five degrees.

26. (original) The apparatus for generating first and second local oscillator signals as in claim 25 wherein a third incremental delay step further comprises a total delay of ninety degrees.

27. (original) The apparatus for generating first and second local oscillator signals as in claim 26 wherein a fourth incremental delay step further comprises a total delay of one-hundred and thirty-five degrees.

28. (previously presented) A method of providing first and delayed second modulator signals for modulation of a quadrature amplitude modulated signal, such method comprising the steps of:

detecting a phase difference relating the first and second modulator signals;

filtering the detected phase difference; and

adjusting the phase difference between the first and second modulator signal based upon the filtered, detected phase difference to a phase difference value equal to ninety degrees divided by a modulator multiplier value for quadrature subharmonic modulation of the quadrature amplitude modulated signal.